

REMARKS

Claims 1-2, 4, 7, 10-11, 16-20, 23-46, 52-55, and 58-84 are pending in the case, claims 3, 5-6, 8-9, 12-15, 21-22, 47-51, and 56-57 having been canceled and claims 64-84 added above. The Office Action rejected each of claims 1-65 on various grounds. More particularly, the Office Action rejected:

- claims 1-23 and 45-63 as non-statutory subject matter under 35 U.S.C. § 101;
- claim 20 as indefinite under 35 U.S.C. § 112;
- claims 1-5, 7-47 and 49-63 as obvious under 35 U.S.C. § 103 over U.S. Publication No. 2003/0071194 (“Mueller, *et al.*”)¹ in combination with allegedly admitted prior art from Applicants’ specification; and
- claims 6 and 48 as obvious under 35 U.S.C. § 103 (a) over Mueller *et al.* in view allegedly admitted prior art from Applicants’ specification and U.S. Publication No. 2004/0030246 (“Townsend”).

Applicants traverse each of the rejections herein.

I. COMMENTS ON AMENDMENTS TO THE CLAIMS

Claims 3, 5-6, 8-9, 14, 47-51, and 56-57 are canceled above for no reason other than cost containment.

Claim 64 is claim 12 rewritten independent form. Claim 12 has therefore been canceled since it has been re-presented in independent form. For similar reasons, claims 13-15 have been canceled and represented as claims 65-67. Claims 70 and 73 are counterparts drafted in program

¹ Applicants do not concede that Mueller *et al.* is in fact prior art. Mueller *et al.* is a publication, not an issued patent, and was published less than one year before Applicants’ filing date. Thus, it is available as “prior art” under 35 U.S.C. §102 under the legal fiction that Applicants’ date of invention coincides with their date of filing such that

storage medium (*i.e.*, “Beauregard”) and programmed computer counterparts. The claims depending from these claims are counterparts to previously presented dependent claims. Accordingly, no new matter has been entered.

Claim 76 is claim 21 rewritten independent form. Claim 21 has therefore been canceled since it has been re-presented in independent form. Claim 21 has therefore been canceled since it has been re-presented in independent form. Claims 79 and 82 are counterparts drafted in program storage medium (*i.e.*, “Beauregard”) and programmed computer counterparts. The claims depending from these claims are counterparts to previously presented dependent claims. Accordingly, no new matter has been entered.

II. CLAIMS 1-23 AND 45-63 ARE STATUTORY SUBJECT MATTER

The Office Action rejected claims 1-23 and 45-63 as non-statutory subject matter under 35 U.S.C. § 101. As a preliminary matter, Applicants believe that the Office intended that claim 44 be included in this rejection, and accordingly responds as if that were the case. Applicants respectfully traverse this rejection on two grounds.

A. The *Prima Facie* Case is Deficient

The Office has failed to establish *prima facie* that the claims are non-statutory subject matter because it has not adequately supported the rejection. The “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility” (the “Interim Guidelines”)² affirmatively state that, “The burden is on the USPTO to set forth a *prima facie* case of unpatentability.” However, the Office’s entire rejection is essentially that the claims are

Mueller *et al.* was invented prior to the present invention. Accordingly, Applicants reserve the right to swear behind Mueller *et al.*

rejected to non-statutory subject matter “...since the claimed invention is directed to claiming software as recited in the preamble....”

This amounts to a *per se* rule against patenting processes in software and there is no such rule in the U.S. patent law. As the Office admits in the Interim Guidelines, the only exclusions to patentable subject matter under the U.S. patent law are ideas, natural phenomena, and laws of nature. If the Office believes that the current claims fall into one of these categories, then it is the Office’s burden to lay out its case to that effect and establish the conclusory proposition that it sets forth. Just saying that it is so does not make it so. Accordingly, the Office has failed to establish *prima facie* that the claims are non-statutory subject matter.

B. The Claims Represent a Statutory Process

Although the Interim Guidelines do not accurately represent or follow the law in this area, the claims represent a statutory process even under those guidelines. The Interim Guidelines, in the relevant part of the analysis, essentially break down the analysis into two parts. One must first determine whether the claims fall into one of the categories set forth in the statute. Assuming the claims do, one must then determine whether the claims nevertheless fall into one of the exclusions.

1. The Claims are for a Process

There can be no rational debate that the claims represent a “process”, which is one of the categories set forth in 35 U.S.C. § 101. More particularly, the claims present a process for generating a three-dimensional model of an item depicted in an image that is performed on or by

² As posted on the Internet at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm>.

an electro-mechanical apparatus. "The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. § 100(b). The claims are clearly a method and present a new use of a known machine.

2. The Claims Do Not Fall Into the Exceptions

As previously noted, the Office failed to adequately set forth its position. Applicants are therefore unaware of the exception into which the Office might consider the claims to fall. However, the claims clearly do not present a law of nature or natural phenomenon. Presumably, by the process of elimination, the Office must consider the claims to present an "abstract idea." The Interim Guidelines state that the claims do not recite an "abstract idea" if they either present a practical application that produces a physical transformation or a useful, concrete, and tangible result. The present claims meet both standards.

a. The Claimed Process Works a Physical Transformation

The process is a physical one and it results in a physical transformation. As stated in the specification:

[0104] Some portions of the detailed descriptions herein are consequently presented in terms of a software implemented process involving symbolic representations of operations on data bits within a memory in a computing system or a computing device. *These descriptions and representations are the means used by those in the art to most effectively convey the substance of their work to others skilled in the art. The process and operation require physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to*

refer to these signals as bits, values, elements, symbols, characters, terms, numbers, pixels, voxels or the like.

[0105] It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated or otherwise as may be apparent, throughout the present disclosure, these descriptions refer to the action and processes of an electronic device, that manipulates and transforms data represented as physical (electronic, magnetic, or optical) quantities within some electronic device's storage into other data similarly represented as physical quantities within the storage, or in transmission or display devices. Exemplary of the terms denoting such a description are, without limitation, the terms "processing," "computing," "calculating," "determining," "displaying," and the like.

(emphasis added) Note that it has been long and well established that claims are to be drafted as though read by those skilled in the art. Accordingly, the claims clearly convey an electro-mechanical process that results in a physical transformation.

As a further example, consider the following thought exercise. Take a computing apparatus that is programmed to perform the claimed method, but on which the claimed method has never been performed. There will not be a three-dimensional model residing anywhere in its storage. This can be called a "first state", *i.e.*, *sans* three dimensional model, of the computing apparatus. Then, perform the method of the invention. A three-dimensional model will then be residing in the storage of the computing apparatus at the end of the method. This can be called a "second state", *i.e.*, with a three-dimensional model, of the computing apparatus.

Note the different states of the computing apparatus before and after the performance of the method of the invention. In the second state, the computing apparatus will undeniably be physically different, or "physically transformed", from what it was in the first state. Before the method is performed, there is no three-dimensional model. After the method is performed, there is. The computing apparatus is therefore different than it was, and it is physically different.

Furthermore, the process by which this physical transformation occurs must also therefore be physical. The computing apparatus is an electro-mechanical apparatus, and the content of the storage is physically changed through the electro-mechanical workings of the computing apparatus.

That the process is electro-mechanical and that the process works a physical transformation is self-evident from the two different physical states of the computing apparatus. The only alternative explanation is that some metaphysical force at work. If the Office disputes the conclusion drawn from the thought exercise presented above, Applicants request the identification of some metaphysical force, whether divine intervention or something else, by which the difference in the two states of the computing apparatus can be achieved.

b. The Claimed Process Yields a Useful, Concrete, and Tangible Result

As is evident on the face of the claims and the application as filed, the claimed method produces a useful, concrete, and tangible result. The method is repeatable, and will consistently yield the same results, *i.e.*, it is “concrete”, in that the same input will result in the same three-dimensional model. The method produces a tangible result, *i.e.*, the three-dimensional model residing in the storage of the computing apparatus on which the method is performed. And, the result is useful. As set forth in the specification and as admitted by the Office, the resulting three-dimensional model can be exported to and embedded in an automatic target recognition (“ATR”) system. A guided munition or submunition operating on the ATR system can then more accurately destroy enemy targets and/or avoid friendly fire incidents. Applicants respectfully submit that those combatants deploying the munition and those whose lives are

saved by preventing the friendly fire incident would consider these results to be quite useful, concrete, and tangible.

3. Conclusion on Statutory Subject Matter

The rejections of claims 1-23 and 45-63 as non-statutory subject matter under 35 U.S.C. § 101 are therefore erroneous. The Office has failed to establish *prima facie* that the claims are non-statutory subject matter because it has not adequately supported the rejection. However, the claims *are* statutory because they are directed to a process that produces a physical transformation and a useful, concrete, and tangible result. Either of these two consequences mean the claims are statutory under the Interim Guidelines as is established above. Accordingly, Applicants request that these rejections be withdrawn.

III. CLAIM 20 IS DEFINITE

The Office Action rejected claim 20 as indefinite under 35 U.S.C. § 112. Applicants have amended claim 20 to cure the alleged indefiniteness. Applicants note that the amendment does not narrow the scope of the claim, but rather merely clarifies that which was already present.

IV. CLAIMS 1-5, 7-47, AND 49-62 ARE NOT OBVIOUS OVER THE ART OF RECORD

The Office Action rejected claims 1-5, 7-47 and 49-63 as obvious under 35 U.S.C. § 103 over U.S. Publication No. 2003/0071194 (“Mueller, *et al.*”) in combination with allegedly admitted prior art from Applicants’ specification. Applicant respectfully submits that these rejections fail because:

- Mueller *et al.* is non-analogous art;
- Mueller *et al.* teaches away; and
- Mueller *et al.* and the allegedly admitted prior art are improperly combined.

Each of these positions will now be developed in turn.

A. Mueller *et al.* is Non- Analogous Art

Mueller *et al.* is from a non-analogous art and therefore may not be properly cited against the present invention. "Two criteria have evolved for determining whether prior art is analogous: (1) [W]hether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved." *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992) (reversing Board holding of obviousness).

Mueller *et al.* is clearly is not from the same field of endeavor as the invention. Applicants' invention is a technique for generating synthetic 3D models for embedment in an ATR. (Delashmit & Jack, ¶ [0002]) Mueller *et al.*, on the other hand, teaches a technique for achieving color fidelity in a scanned, 2D image of a 3D object. (Mueller *et al.*, ¶ [0003]) Thus, on the face of the application and Mueller *et al.*, they are not from the same field of endeavor.

Mueller *et al.* furthermore is not "reasonably pertinent" to the Applicants' problem.

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. Thus, the purposes of both the inventor and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well

have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have less motivation or occasion to consider it.

In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992).

Applicants were addressing the difficulty of developing synthetic three-dimensional images of vehicles for use in an automatic target recognition (“ATR”) system. (Delashmit & Jack, ¶¶ [0003] – [0009]) More particularly, Applicants were addressing the difficulty posed in the prior art by having to have the vehicle present. (*Id.*, especially ¶ [0009]) Mueller *et al.* is about getting the color correct in a two-dimensional, scanned image of a three-dimensional object. (Mueller *et al.*, ¶¶ [0004] – [0009]) These are two very different purposes, and “the inventor(s) would accordingly have less motivation or occasion to consider it.” *Clay*, 966 F.2d at 659. There is no reason why one confronting Applicants’ problem. That is, there is no reason to seek a three-dimensional synthetic modeling technique for a three-dimensional object for embedment in an ATR in a reference on producing correct color in a two-dimensional scanned image.

Furthermore, even if the above were not true, the Office has failed to establish that Mueller *et al.* is within the scope and content of the art. It is the Office's burden to establish *prima facie* that the claimed invention is obvious. This includes the burden of showing that the references are within the scope and content of the prior art. *In re Oetiker*, 24 U.S.P.Q.2d (BNA) 1443, 1445-46 (Fed. Cir. 1992). Although the Office has impliedly alleged that Mueller *et al.* is within the scope and content of the art merely by its citation, the Office has not established the proposition.

B. Mueller *et al.* Teaches Away

To the extent that the Office maintains that Mueller *et al.* is within the scope and content of the prior art, it teaches away. While Mueller *et al.* does teach that data image acquisition can be done remotely (§ [0052]), it subsequently indicates that this is very undesirable for a whole variety of problems. More particularly, Mueller *et al.* teaches that it is very desirable to achieve a high degree of integration in the equipment—*i.e.*, the processing system and the image processor. (§§ [0117], [0119] – [0121]) This necessarily implies that Mueller *et al.* is teaching that it is more preferable to bring the scanned object to the equipment in which the data will be processed.

Thus, Mueller *et al.* teaches that circumstance which is precisely the problem Applicants are trying to overcome is the preferable approach. Indeed, one circumstance that the present invention seeks to address is the situation in which the object to be modeled cannot actually be brought to the equipment that is to do the modeling. (§[0008]) Mueller *et al.* therefore teaches away from Applicants' invention. It is by now well established that teaching away by the prior art constitutes *prima facie* evidence that the claimed invention is not obvious. *See, inter alia, In re Fine*, 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Nielson*, 2 U.S.P.Q.2d (BNA) 1525, 1528 (Fed. Cir. 1987); *In re Hedges*, 228 U.S.P.Q. (BNA) 685, 687 (Fed. Cir. 1986).

C. Mueller *et al.* and the Allegedly Admitted Prior Art are Improperly Combined

The Office apparently is citing the discussion in Applicants' specification at § [0004] – [0009] ("AAPA") and then combines it with the teachings of Mueller *et al.* On this combination, the Office asserts that a three dimensional software model developed as claimed and embedded in an automatic target recognition ("ATR") system would have been obvious. However, the Office has improperly combined the AAPA and the teachings of Mueller *et al.*

As was established above, to the extent that the Office maintains that Mueller *et al.* is within the scope and content of the prior art, it teaches away from the present invention. There can be no motivation or suggestion to combine references as a matter of law where one of the references teaches away from the claimed invention. *In re Fine*, 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Gordon*, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984).

VI. THE NEW CLAIMS ARE ALLOWABLE

Claim 64 is claim 12 rewritten independent form and claims 70 and 73 are counterparts drafted in program storage medium (*i.e.*, “Beauregard”) and programmed computer counterparts. Claim 64 recites that the 3D model is generated in two steps, the first of which defines a 3D space in which the second generates the final geometry. This is not disclosed in the art of record. In the course of rejecting claim 12, the Office states only that this limitations is dealt with in the rejections of claims 1 and 2, which is manifestly untrue since this limitation does not appear in claim 1 or claim 2. The rejections of claims 1 and 2 rely on ¶¶[0049]-[0050], and [0064] of U.S. Publication No. 2003/0071194 (“Mueller, *et al.*”) for teaching these types of limitations. However, these paragraphs disclose that the “three dimensional model” is developed in a single step and is then overlaid with color information. This is not the same as generating the 3D geometry in two steps.

Claim 76 is claim 21 rewritten independent form and claims 79 and 82 are counterparts drafted in program storage medium (*i.e.*, “Beauregard”) and programmed computer counterparts. These claims recite that the 3D model is a 3D model of LADAR returns. This also is not taught by the art of record. The Office alleges that this is taught in ¶¶[0049], [0146] of Mueller *et al.* However, ¶[0049] contains no hint or suggestion of such a thing. LADAR is mentioned in

¶[0146], but only as part of a larger discussion in ¶¶[0144]-[0147] regarding how range finding systems such as LADAR may be used to acquire data on which the technique disclosed therein operates. There is no teaching or suggestion of modeling LADAR returns, which is consistent with the reference's goal of improving color correctness in 2D scanned images of 3D objects.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 706.02(j); *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). The art of record therefore fails to teach all the limitations of the new claims 64-84. Accordingly, the new claims are in condition for allowance.

V. CLAIMS 6 AND 48 ARE NOT OBVIOUS OVER THE ART OF RECORD

The Office Action rejected claims 6 and 48 as obvious under 35 U.S.C. § 103 (a) over Mueller *et al.* in view allegedly admitted prior art from Applicants' specification and U.S. Publication No. 2004/0030246 ("Townsend"). These rejections rely upon the combination of Mueller *et al.* and the discussion in Applicants' specification at ¶¶ [0004] – [0009] ("AAPA") for teaching the limitations of the independent claims, and so suffer from the same defects. Accordingly, Applicants hereby adopt the arguments set forth above in response to the rejections of claims 1-5, 7-47 and 49-63 in response to the rejections of claim 6 and 48.

VI. CONCLUDING REMARKS

Applicants therefore respectfully submit that the claims are in condition for allowance, and requests that the rejections be withdrawn and the claims allowed to issue. The Examiner is invited to contact the undersigned attorney at (713) 934-4053 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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